

## Refine Search

### Search Results -

| Terms                     | Documents |
|---------------------------|-----------|
| L2 and (phase near3 free) | 73        |

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Search:

L3





### Search History

DATE: Friday, February 04, 2005    [Printable Copy](#)    [Create Case](#)

| <u>Set</u><br><u>Name</u>                 | <u>Query</u>   | <u>Hit</u><br><u>Count</u> | <u>Set</u><br><u>Name</u><br>result set |
|---|--|----------------------------|---|
| <i>DB=PGPB,USPT,USOC; PLUR=YES; OP=OR</i> |  |                            |   |
| <u>L3</u>                                 | L2 and (phase near3 free)  | 73                         | <u>L3</u>                               |
| <u>L2</u>                                 | (bus near3 phase) same (target or destination or receiver) same SCSI                   | 139                        | <u>L2</u>                               |
| <u>L1</u>                                 | (bus near3 phase) same ((target or destination or receiver) near3 comput\$3) same SCSI | 3                          | <u>L1</u>                               |

END OF SEARCH HISTORY

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| Terms | Documents |
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| L3    | 0         |

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Search:

L4  





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|--|--|----------------------------|---|
| <i>DB=EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR</i> |  |                            |   |
| <u>L4</u>                                      | L3   | 0                          | <u>L4</u>                               |
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| <u>L3</u>                                      | L2 and (phase near3 free)  | 73                         | <u>L3</u>                               |
| <u>L2</u>                                      | (bus near3 phase) same (target or destination or receiver) same SCSI                   | 139                        | <u>L2</u>                               |
| <u>L1</u>                                      | (bus near3 phase) same ((target or destination or receiver) near3 comput\$3) same SCSI | 3                          | <u>L1</u>                               |

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### Search Results -

| Terms   | Documents |
|---|-----------|
| (L2 same (network or comput\$3)) and (phase near3 free) | 27        |

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Search:

L7





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|--|--|------------------|-------------------------------|
| <i>DB=PGPB,USPT,USOC; PLUR=YES; OP=OR</i>      |  |                  |                               |
| <u>L7</u>                                      | (L2 same (network or comput\$3)) and (phase near3 free)                                | 27               | <u>L7</u>                     |
| <u>L6</u>                                      | L2 same ((network or comput\$3) and (phase near3 free))                                | 19               | <u>L6</u>                     |
| <u>L5</u>                                      | l3 and (network or comput\$3)  | 72               | <u>L5</u>                     |
| <i>DB=EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR</i> |  |                  |                               |
| <u>L4</u>                                      | L3   | 0                | <u>L4</u>                     |
| <i>DB=PGPB,USPT,USOC; PLUR=YES; OP=OR</i>      |  |                  |                               |
| <u>L3</u>                                      | L2 and (phase near3 free)  | 73               | <u>L3</u>                     |
| <u>L2</u>                                      | (bus near3 phase) same (target or destination or receiver) same SCSI                   | 139              | <u>L2</u>                     |
| <u>L1</u>                                      | (bus near3 phase) same ((target or destination or receiver) near3 comput\$3) same SCSI | 3                | <u>L1</u>                     |

END OF SEARCH HISTORY

## Refine Search

### Search Results -

| Terms   | Documents |
|---|-----------|
| (370/501   370/492   710/314   710/72   710/105   710/113   710/36   710/315   710/107   710/119   710/309   710/305   711/112   712/1).ccls. | 6740      |

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 US OCR Full-Text Database  
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 JPO Abstracts Database  
 Derwent World Patents Index  
 IBM Technical Disclosure Bulletins

Search:

L1

Refine Search

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### Search History

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Count   Set  
             Name  
             result  
             set

DB=PGPB,USPT,USOC; PLUR=YES; OP=OR

L1    710/314,72,105,113,36,315,107,119,309,305;370/501,492;711/112;712/1.ccls.    6740    L1

END OF SEARCH HISTORY

## Refine Search

### Search Results -

| Terms                         | Documents |
|-------------------------------|-----------|
| L3 and (comput\$3 or network) | 54        |

Database:

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Search:

L4





### Search History

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| <u>Set</u><br><u>Name</u>                 | <u>Query</u>  | <u>Hit</u><br><u>Count</u> | <u>Set</u><br><u>Name</u><br>result<br>set |
|---|---|----------------------------|--|
| <i>DB=PGPB,USPT,USOC; PLUR=YES; OP=OR</i> |   |                            |  |
| <u>L4</u>                                 | L3 and (comput\$3 or network)   | 54                         | <u>L4</u>                                  |
| <u>L3</u>                                 | l1 and L2   | 60                         | <u>L3</u>                                  |
| <u>L2</u>                                 | (bus near3 phase) same (target or destination or receiver) same SCSI      | 139                        | <u>L2</u>                                  |
| <u>L1</u>                                 | 710/314,72,105,113,36,315,107,119,309,305;370/501,492;711/112;712/1.ccls. | 6740                       | <u>L1</u>                                  |

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L1: (7) (bus near3 phase) sar

Failed

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UDC

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Trash

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DBsUSPAT

Default operator: OR

Plurals

Highlight all hit terms initially

BRS formIS&R formImageTextHTML

|   | Type | L # | Hits | Search Text  | DBs   | Time Stamp          | Comments | Error Definition | Err |
|---|------|-----|------|--|-------|---------------------|----------|------------------|-----|
| 1 | BRS  | L1  | 7    | (bus near3 phase) same<br>((target or destination or | USPAT | 2005/02/04<br>09:52 |          |                  |     |

Start

EAST - [Untitled1:1]

|   | Type | L # | Hits | Search Text  | DBs   | Time Stamp          | Comments | Error Definition | Err |
|---|------|-----|------|--|-------|---------------------|----------|------------------|-----|
| 1 | BRS  | L1  | 7    | (bus near3 phase) same<br>((target or destination or | USPAT | 2005/02/04<br>09:52 |          |                  |     |

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bus and phase and scsi

**Search**☐ Check to search within this result set**Results Key:****JNL** = Journal or Magazine **CNF** = Conference **STD** = Standard**1 I/O issues in a multimedia system***Narasimha Reddy, A.L.; Wyllie, J.C.;*

Computer, Volume: 27, Issue: 3, March 1994

Pages:69 - 74

[\[Abstract\]](#) [\[PDF Full-Text \(612 KB\)\]](#) **IEEE JNL**
**2 A SEM-E module avionics computer with PI-Bus backplane communication***Dougherty, M.J.;*

Aerospace and Electronics Conference, 1990. NAECON 1990., Proceedings of the IEEE 1990 National, 21-25 May 1990

Pages:169 - 173 vol.1

[\[Abstract\]](#) [\[PDF Full-Text \(412 KB\)\]](#) **IEEE CNF**

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## I/O issues in a multimedia system

Narasimha Reddy, A.L. Wyllie, J.C.

IBM Almaden Res. Center, San Jose, CA, USA;

*This paper appears in: Computer*

Publication Date: March 1994

On page(s): 69 - 74

Volume: 27 , Issue: 3

ISSN: 0018-9162

Reference Cited: 12

CODEN: CPTRB4

Inspec Accession Number: 4673959

### Abstract:

In future computer system design, I/O systems will have to support continuous media such as video and audio, whose system demands are different from those of data such as text. Multimedia computing requires us to focus on designing I/O systems that can handle real-time demands. Video- and audio-stream playback and teleconferencing are real-time applications with different I/O demands. We primarily consider playback applications which require guaranteed real-time I/O throughput. In a multimedia server, different service **phases** of a real-time request are disk, small computer systems interface (**SCSI**) bus, and processor scheduling. Additional service might be needed if

the request must be satisfied across a local area network. We restrict ourselves to the support provided at the server, with special emphasis on two service **phases**: disk scheduling and **SCSI bus** contention. When requests have to be satisfied within deadlines, traditional real-time systems use scheduling algorithms such as earliest deadline first (EDF) and least slack time first. However, EDF makes the assumption that disks are preemptable, and the seek-time overheads of its strict real-time scheduling result in poor disk utilization. We can provide the constant data rate necessary for real-time requests in various ways that require trade-offs. We analyze how trade-offs that involve buffer space affect the performance of scheduling policies. We also show that deferred deadlines, which increase buffer requirements, improve system performance significantly

---

### Index Terms:

[buffer storage](#) [file servers](#) [input-output programs](#) [multimedia systems](#) [peripheral interfaces](#) [real-time systems](#) [scheduling](#) [I/O issues](#) [SCSI bus contention](#) [computer system design](#) [constant data rate](#) [continuous media](#) [deferred deadlines](#) [disk scheduling](#) [earliest deadline first](#) [least slack time first](#) [local area network](#) [multimedia computing](#) [multimedia server](#) [multimedia system](#) [playback applications](#) [processor scheduling](#) [real-time I/O throughput](#) [real-time demands](#) [real-time request](#) [scheduling policies](#) [service phases](#) [small computer systems interface](#) [bus](#) [system demands](#)

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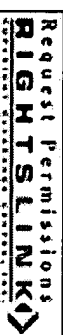
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## A SEM-E module avionics computer with PI-Bus backplane communication

Dougherty, M.J.

Texas Instrum. Inc., Dallas, TX, USA;

*This paper appears in: Aerospace and Electronics Conference, 1990. NAECON 1990, Proceedings of the IEEE 1990 National*

Meeting Date: 05/21/1990 - 05/25/1990

Publication Date: 21-25 May 1990

Location: Dayton, OH USA

On page(s): 169 - 173 vol.1

Reference Cited: 3

Inspec Accession Number: 3863903

### Abstract:

The author describes the system architecture of a MIL-STD-1750A-based mission processor utilizing dual VHSIC Phase 2 TM-Bus and dual VHSIC Phase 2 PI-Bus for intermodule level communication. The mission processor consists of 18 surface-mount SEM-E modules and five high-density power supplies mating with an 18 layer G-10 backplane in an air-cooled chassis. The system-level interfaces consists of a dual PI-Bus for intermodule communication, a dual TM-Bus for intermodule operational test and maintenance, an IEEE-488 interface to an external software development platform, two

differential small computer system interface (**SCSI**) buses, three dual redundant MIL-STD-1553B serial communication buses, and several digital and analog discrete I/Os. The author presents a comparison of the defined cycle sequence of each of the basic **PI-Bus** messages to the observed cycle structure of these message types in the system. The impact of chaining a sequence of **PI-Bus** messages is examined. Data on the impact of **PI-Bus** traffic on module performance under various conditions are examined

---

**Index Terms:**

VLSI aircraft instrumentation computer architecture computer interfaces microprocessor chips  
military equipment G-10 backplane IEEE-488 interface PI-Bus backplane communication PI-Bus  
traffic SEM-E module avionics computer Texas Instruments air-cooled chassis computer  
interfaces dual TM-Bus dual VHSLC Phase 2 TM-Bus dual redundant MIL-STD-1553B serial  
communication buses high-density power supplies intermodule communication mission  
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L4: Entry 48 of 54

File: USPT

Jun 18, 1996

US-PAT-NO: 5528765

DOCUMENT-IDENTIFIER: US 5528765 A

**\*\* See image for Certificate of Correction \*\***

TITLE: SCSI bus extension system for controlling individual arbitration on interlinked SCSI bus segments

DATE-ISSUED: June 18, 1996

INVENTOR-INFORMATION:

| NAME               | CITY      | STATE | ZIP CODE | COUNTRY |
|--------------------|-----------|-------|----------|---------|
| Milligan; James H. | Shoreview | MN    |          |         |

ASSIGNEE-INFORMATION:

| NAME                          | CITY       | STATE | ZIP CODE | COUNTRY | TYPE CODE |
|-------------------------------|------------|-------|----------|---------|-----------|
| R. C. Baker & Associates Ltd. | Burnsville | MN    |          |         | 02        |

APPL-NO: 08/ 031604   [\[PALM\]](#)

DATE FILED: June 15, 1993

INT-CL: [06] [G06](#) [F 13/36](#)

US-CL-ISSUED: 395/287; 395/200.06, 370/85.2, 370/85.4, 364/240, 364/240.2, 364/242.6, 364/242.92, 364/DIG.1

US-CL-CURRENT: [710/107](#); [370/451](#), [370/462](#), [709/225](#), [709/249](#)

FIELD-OF-SEARCH: 395/325, 395/275, 395/200, 395/200.06, 395/285, 395/287, 395/306, 395/308, 370/85.2, 370/85.4, 370/85.6, 340/825.5, 340/825.51

PRIOR-ART-DISCLOSED:

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| <input type="checkbox"/> | <a href="#">4257095</a> | March 1981    | Nadir            | 395/325 |
| <input type="checkbox"/> | <a href="#">4320467</a> | March 1982    | Glass            | 395/301 |
| <input type="checkbox"/> | <a href="#">4620278</a> | October 1986  | Ellsworth et al. | 395/325 |
| <input type="checkbox"/> | <a href="#">4706190</a> | November 1987 | Bomba et al.     | 395/325 |
| <input type="checkbox"/> | <a href="#">4961140</a> | October 1990  | Pechanek et al.  | 395/285 |
| <input type="checkbox"/> | <a href="#">5129090</a> | July 1992     | Bland et al.     | 395/725 |

|                          |                |                |               |            |
|--------------------------|----------------|----------------|---------------|------------|
| <input type="checkbox"/> | <u>5206946</u> | April 1993     | Brunk         | 395/500    |
| <input type="checkbox"/> | <u>5237695</u> | August 1993    | Skokan        | 395/725    |
| <input type="checkbox"/> | <u>5239651</u> | August 1993    | Sodos         | 395/725    |
| <input type="checkbox"/> | <u>5265211</u> | November 1993  | Amini et al.  | 395/325    |
| <input type="checkbox"/> | <u>5293493</u> | March 1994     | Smith et al.  | 395/325    |
| <input type="checkbox"/> | <u>5317696</u> | May 1994       | Hilgendorf    | 395/325    |
| <input type="checkbox"/> | <u>5345562</u> | September 1994 | Chen          | 395/275    |
| <input type="checkbox"/> | <u>5412783</u> | May 1995       | Skokan        | 395/285    |
| <input type="checkbox"/> | <u>5418914</u> | May 1995       | Heil et al.   | 395/293    |
| <input type="checkbox"/> | <u>5440698</u> | August 1995    | Sindhu et al. | 395/200.08 |
| <input type="checkbox"/> | <u>5454111</u> | September 1995 | Frame et al.  | 395/288    |

ART-UNIT: 235

PRIMARY-EXAMINER: Ray; Gopal C.

ATTY-AGENT-FIRM: Baker; Robert C. Proehl; Jeffrey A.

ABSTRACT:

This digital communication method and system permits extended distance communication on a SCSI bus despite the time constraints imposed on certain bus operations such as arbitration. The bus system is comprised of discrete bus segments each having a portal node and one or more devices interfaced thereon. All nodes are connected together by a serial link. Each node seizes control of its bus segment and imposes a pseudo-busy condition to prevent bus operations such as arbitration. A token message passed over the serial link between nodes allows one node at a time to release control of its segment to permit arbitration among the devices interfaced on its segment. A source device on the released segment that gains control of the segment as a result of arbitration may communicate with a destination device anywhere on the bus system.

37 Claims, 9 Drawing figures

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L1: Entry 1 of 2

File: USPT

Nov 28, 2000

US-PAT-NO: 6154799

DOCUMENT-IDENTIFIER: US 6154799 A

TITLE: Repeater-switch for distributed arbitration digital data buses

DATE-ISSUED: November 28, 2000

## INVENTOR-INFORMATION:

| NAME  | CITY              | STATE | ZIP | CODE | COUNTRY |
|---|-------------------|-------|-----|------|---------|
| Gafford; Thomas Austin                      | Redondo Beach     | CA    |     |      |         |
| Eross, deceased; Botond Gabor               | late of Palo Alto | CA    |     |      |         |
| Moorer, legal representative; by James A.   | San Rafael        | CA    |     |      |         |
| Barrie, legal representative; by Barbara L. | San Rafael        | CA    |     |      |         |

## ASSIGNEE-INFORMATION:

| NAME               | CITY          | STATE | ZIP | CODE | COUNTRY | TYPE | CODE |
|--------------------|---------------|-------|-----|------|---------|------|------|
| Gafford; Thomas A. | Redondo Beach | CA    |     |      |         | 04   |      |

APPL-NO: 09/ 084163 [PALM]

DATE FILED: May 25, 1998

## PARENT-CASE:

This is a continuation of application Ser. No. 07/923,996 filed Aug. 16, 1993, which issued May 26, 1998, as U.S. Pat. No. 5,758,109.

INT-CL: [07] G06 F 13/00

US-CL-ISSUED: 710/107; 710/128, 710/129

US-CL-CURRENT: 710/107; 710/119

FIELD-OF-SEARCH: 710/107, 710/126, 710/127, 710/128, 710/129, 710/131, 710/100, 710/119

## PRIOR-ART-DISCLOSED:

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PAT-NO

ISSUE-DATE

PATENTEE-NAME

US-CL

☐4296469

October 1981

Gunter et al.

395/325

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|--------------------------|----------------|----------------|----------------------|-----------|
| <input type="checkbox"/> | <u>4604689</u> | August 1986    | Burger               | 364/200   |
| <input type="checkbox"/> | <u>4716525</u> | December 1987  | Gilanyi et al.       | 364/200   |
| <input type="checkbox"/> | <u>4821170</u> | April 1989     | Bernick et al.       | 364/200   |
| <input type="checkbox"/> | <u>4864291</u> | September 1989 | Korpi                | 340/825.5 |
| <input type="checkbox"/> | <u>5239632</u> | August 1993    | Larner               | 395/325   |
| <input type="checkbox"/> | <u>5239653</u> | August 1993    | Cubero-Castan et al. | 395/325   |
| <input type="checkbox"/> | <u>5274783</u> | December 1993  | House et al.         | 395/325   |
| <input type="checkbox"/> | <u>5337413</u> | August 1994    | Lui et al.           | 398/822   |
| <input type="checkbox"/> | <u>5367647</u> | November 1994  | Coulson et al.       | 395/325   |
| <input type="checkbox"/> | <u>5418914</u> | May 1995       | Heil et al.          | 395/293   |

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United States Statutory Invention Registration No. H696, Oct. 3, 1989 Willard S. Davidson.

"OEMs Scramble to Launch Diverse SCSI Devices," Barry W. Phillips, Electronic Design, May 26, 1988, pp. 29-34.

"Intelligent Host Adapter Directs I/O Traffic, Freeing Up Host Processor," Robert Snively. Electronic Design, Sep. 20, 1984, pp. 243-252.

"Ethernet Controller Adds Communications to SCSI Bus," Tomas Russ, electronic Design, Sep. 8, 1988, pp. 91-96.

"American National Standard X3.131-1986," pp. 22-61.

ART-UNIT: 271

PRIMARY-EXAMINER: Sheikh; Ayaz R.

ASSISTANT-EXAMINER: Chung-Trans; Xuong

ATTY-AGENT-FIRM: Schreiber; Donald E.

## ABSTRACT:

The technical field of the invention generally concerns digital computers and, in particular, repeaters or switches (40) for distributed arbitration digital data buses (52, 54, 56, and 58) to which devices (62, 64, 66, 68, 72 and 74) connect in parallel. The bus repeater/switch (40) includes a plurality of bus interface cards (48) that are connected to the distributed arbitration buses (52, 54, 56 and 58) for receiving signals from and transmitting signals to devices (62, 64, 66, 68, 72 and 74) connected thereto. The bus interface cards (48) connect to a control card (44) which allows signals from one of the sharing buses (52, 54 or 56) to be exchanged with the shared bus (58). The bus switch (40) also includes selector switch (84 or 88) for choosing which particular one of the sharing buses (52, 54 or 56) exchanges digital data signals with the shared bus (58). The bus switch (40) responds to signals on the distributed arbitration buses (52, 54, 56 and 58) and to phases of the protocol for those signals so that its presence between pairs of buses (52-58, 54-58 or 56-58) is imperceptible to devices (62, 64, 66, 68, 72 and 74) connected thereto.

13 Claims, 9 Drawing figures

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L1: Entry 2 of 2

File: USPT

May 26, 1998

US-PAT-NO: 5758109

DOCUMENT-IDENTIFIER: US 5758109 A

TITLE: Repeater/switch for distributed arbitration digital data buses

DATE-ISSUED: May 26, 1998

## INVENTOR-INFORMATION:

| NAME                             | CITY              | STATE | ZIP CODE | COUNTRY |
|----------------------------------|-------------------|-------|----------|---------|
| Gafford; Thomas Austin           | Redondo Beach     | CA    |          |         |
| Eross, deceased; Botond Gabor    | late of Palo Alto | CA    |          |         |
| Morrer, co executor; James A.    | San Rafael        | CA    |          |         |
| Barrie, co executrix; Barbara L. | San Rafael        | CA    |          |         |

## ASSIGNEE-INFORMATION:

| NAME               | CITY          | STATE | ZIP CODE | COUNTRY | TYPE CODE |
|--------------------|---------------|-------|----------|---------|-----------|
| Gafford; Thomas A. | Redondo Beach | CA    |          |         | 04        |

APPL-NO: 07/ 923996 [\[PALM\]](#)

DATE FILED: August 16, 1993

## PCT-DATA:

| APPL-NO        | DATE-FILED     | PUB-NO     | PUB-DATE    | 371-DATE     | 102(E)-DATE  |
|----------------|----------------|------------|-------------|--------------|--------------|
| PCT/US90/01468 | March 19, 1990 | WO91/14989 | Oct 3, 1991 | Aug 16, 1993 | Aug 16, 1993 |

INT-CL: [06] [G06 F 13/00](#)

US-CL-ISSUED: 395/308; 395/309

US-CL-CURRENT: [710/309](#)

FIELD-OF-SEARCH: 395/325, 395/308, 395/309, 395/306, 395/299, 307/85.13, 307/85.6, 307/94.7

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

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| PAT-NO   | ISSUE-DATE   | PATENTEE-NAME | US-CL   |
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| <input type="checkbox"/> <a href="#">4604689</a> | August 1986  | Burger        | 364/200 |

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| <input type="checkbox"/> | <u>4716525</u> | December 1987  | Gilanyi et al.       | 364/200   |
| <input type="checkbox"/> | <u>4821170</u> | April 1989     | Bernick et al.       | 364/200   |
| <input type="checkbox"/> | <u>4864291</u> | September 1989 | Korpi                | 340/825.5 |
| <input type="checkbox"/> | <u>5239632</u> | August 1993    | Larner               | 395/325   |
| <input type="checkbox"/> | <u>5239653</u> | August 1993    | Cubero-Castan et al. | 395/325   |
| <input type="checkbox"/> | <u>5274783</u> | December 1993  | House et al.         | 395/325   |
| <input type="checkbox"/> | <u>5367647</u> | November 1994  | Coulson et al.       | 395/325   |

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"OEMs Scramble to Launch Diverse SCSI Devices," Barry W. Phillips, Electronic Design, May 26, 1988, pp. 29-34.

"Intelligent Host Adapter Directs I/O Traffic, Freeing Up Host Processor," Robert Snively, Electronic Design, Sep. 20, 1984, pp. 243-252.

"Ethernet Controller Adds Communications to SCSI Bus," Tomas Russ, Electronic Design, Sep. 8, 1988, pp. 91-96.

ART-UNIT: 235

PRIMARY-EXAMINER: Ray; Gopal C.

ASSISTANT-EXAMINER: Chunk-Trans; Xuonk

ATTY-AGENT-FIRM: Schreiber; Donald E.

## ABSTRACT:

The technical field of the invention generally concerns digital computers and, in particular, repeaters or switches (40) for distributed arbitration digital data buses (52, 54, 56, and 58) to which devices (62, 64, 66, 68, 72 and 74) connect in parallel. The bus repeater/switch (40) includes a plurality of bus interface cards (48) that are connected to the distributed arbitration buses (52, 54, 56 and 58) for receiving signals from and transmitting signals to devices (62, 64, 66, 68, 72 and 74) connected thereto. The bus interface cards (48) connect to a control card (44) which allows signals from one of the sharing buses (52, 54 or 56) to be exchanged with the shared bus (58). The bus switch (40) also includes selector switch (84 or 88) for choosing which particular one of the sharing buses (52, 54 or 56) exchanges digital data signals with the shared bus (58). The bus switch (40) responds to signals on the distributed arbitration buses (52, 54, 56 and 58) and to phases of the protocol for those signals so that its presence between pairs of buses (52-58, 54-58 or 56-58) is imperceptible to devices (62, 64, 66, 68, 72 and 74) connected thereto.

14 Claims, 9 Drawing figures

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L7: Entry 2 of 27

File: PGPB

Nov 11, 2004

PGPUB-DOCUMENT-NUMBER: 20040225824  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20040225824 A1

TITLE: Network of computing devices including a repeater for distributed arbitration digital data buses

PUBLICATION-DATE: November 11, 2004

INVENTOR-INFORMATION:

| NAME                   | CITY          | STATE | COUNTRY | RULE-47 |
|------------------------|---------------|-------|---------|---------|
| Gafford, Thomas Austin | Redondo Beach | CA    | US      |         |
| Eross, Botond Gabor    | Palo Alto     | CA    | US      |         |
| Moorer, James A.       | San Rafael    | CA    | US      |         |

APPL-NO: 10/ 824072 [\[PALM\]](#)  
DATE FILED: April 13, 2004

RELATED-US-APPL-DATA:

Application 10/824072 is a continuation-of US application 10/243537, filed September 14, 2002, ABANDONED  
Application 10/243537 is a continuation-of US application 09/677853, filed October 3, 2000, ABANDONED  
Application 09/677853 is a continuation-of US application 09/084163, filed May 25, 1998, US Patent No. 6154799  
Application 09/084163 is a continuation-of US application 07/923996, filed August 16, 1993, US Patent No. 5758109  
Application 07/923996 is a a-371-of-international WO application PC/T/US90/01468, filed March 19, 1990, PENDING

INT-CL: [07] [G06](#) [F](#) [13/36](#)

US-CL-PUBLISHED: 710/314  
US-CL-CURRENT: [710/314](#)

REPRESENTATIVE-FIGURES: 2

ABSTRACT:

The technical field of the invention generally concerns digital computers and, in particular, repeaters or switches (40) for distributed arbitration digital data buses (52, 54, 56 and 58) to which devices (62, 64, 66, 68, 72 and 74) connect in parallel. The bus repeater/switch (40) includes a plurality of bus interface cards (48) that are connected to the distributed arbitration buses (52, 54, 56 and 58) for receiving signals from and transmitting signals to devices (62, 64, 66, 68, 72 and 74) connected thereto. The bus interface cards (48) connect to a control card (44) which allows signals from one of the sharing buses (52, 54 or 56) to be

exchanged with the shared bus (58). The bus switch (40) also includes selector switch (84 or 88) for choosing which particular one of the sharing buses (52, 54 or 56) exchanges digital data signals with the shared bus (58). The bus switch (40) responds to signals on the distributed arbitration buses (52, 54, 56 and 58) and to phases of the protocol for those signals so that its presence between pairs of buses (52-58, 54-58 or 56-58) is imperceptible to devices (62, 64, 66, 68, 72 and 74) connected thereto.

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L7: Entry 10 of 27

File: USPT

Dec 1, 1998

US-PAT-NO: 5845154

DOCUMENT-IDENTIFIER: US 5845154 A

TITLE: System for supplying initiator identification information to SCSI bus in a  
reselection phase of an initiator before completion of an autotransfer command

DATE-ISSUED: December 1, 1998

## INVENTOR-INFORMATION:

| NAME                | CITY     | STATE | ZIP CODE | COUNTRY |
|---------------------|----------|-------|----------|---------|
| Krakirian; Shahe H. | Milpitas | CA    |          |         |

## ASSIGNEE-INFORMATION:

| NAME          | CITY     | STATE | ZIP CODE | COUNTRY | TYPE CODE |
|---------------|----------|-------|----------|---------|-----------|
| Adaptec, Inc. | Milpitas | CA    |          |         | 02        |

APPL-NO: 08/ 463333 [\[PALM\]](#)

DATE FILED: June 5, 1995

## PARENT-CASE:

This application is a division of application Ser. No. 08/205,002, still pending,  
filed Mar. 1, 1994.

INT-CL: [06] [G06 F 13/00](#), [G06 F 13/42](#)

US-CL-ISSUED: 395/894; 395/800, 395/285, 395/309, 395/439, 395/825

US-CL-CURRENT: [710/74](#); [710/105](#), [710/5](#), [711/112](#)

FIELD-OF-SEARCH: 395/325, 395/878, 395/285, 395/287, 395/281, 395/800, 395/309,  
395/439, 395/825, 395/894, 364/238.3, 364/239, 364/248.1

## PRIOR-ART-DISCLOSED:

## U.S. PATENT DOCUMENTS

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|                          | PAT-NO                  | ISSUE-DATE    | PATENTEE-NAME | US-CL   |
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| <input type="checkbox"/> | <a href="#">4503499</a> | March 1985    | Mason et al.  | 395/650 |
| <input type="checkbox"/> | <a href="#">4815030</a> | March 1989    | Cross et al.  | 395/600 |
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| <input type="checkbox"/> | <u>5022059</u> | June 1991      | Arai              | 377/39    |
| <input type="checkbox"/> | <u>5129072</u> | July 1992      | Larner et al.     | 395/425   |
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| <input type="checkbox"/> | <u>5233692</u> | August 1993    | Gajjar et al.     | 395/325   |
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| <input type="checkbox"/> | <u>5274783</u> | December 1993  | House et al.      | 395/325   |
| <input type="checkbox"/> | <u>5287463</u> | February 1994  | Frame et al.      | 395/325   |
| <input type="checkbox"/> | <u>5325510</u> | June 1994      | Frazier           | 395/425   |
| <input type="checkbox"/> | <u>5367647</u> | November 1994  | Coulson et al.    | 395/325   |
| <input type="checkbox"/> | <u>5379379</u> | January 1995   | Becker et al.     | 395/250   |
| <input type="checkbox"/> | <u>5404549</u> | April 1995     | Tauscheck         | 395/800   |
| <input type="checkbox"/> | <u>5421014</u> | May 1995       | Bucher            | 395/650   |
| <input type="checkbox"/> | <u>5428787</u> | June 1995      | Pineau            | 395/700   |
| <input type="checkbox"/> | <u>5450546</u> | September 1995 | Krakirian         | 395/250   |
| <input type="checkbox"/> | <u>5454085</u> | September 1995 | Gajjar et al.     | 395/285   |
| <input type="checkbox"/> | <u>5455954</u> | October 1995   | Packer            | 395/894   |
| <input type="checkbox"/> | <u>5463743</u> | October 1995   | Galloway          | 395/285   |
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Preliminary Data Sheet, Apr. 1993, "AIC-8210 Dual-Bit Automated High-Performance SCSI Controller IC", Adaptec, Inc., pp. i-288.  
"Fast Track to SCSI--A Product Guide", Fujitsu Microelectronics, Inc., Integrated Circuits Division, Prentice-Hall, Inc., 1991, pp. iii through Index-7.

ART-UNIT: 237

PRIMARY-EXAMINER: Lee; Thomas C.

ASSISTANT-EXAMINER: Chen; Anderson I.

ATTY-AGENT-FIRM: Skjerven, Morrill, MacPherson, Franklin and Friel Gunnison;  
Forrest E. Wallace; T. Lester

## ABSTRACT:

A hard disk controller integrated circuit of a SCSI target device comprises a sequencer which causes a SCSI bus to transition from a command bus phase to a data transfer bus phase during execution of an autoread or an autowrite SCSI command without waiting for a communication from a microprocessor of the SCSI target

device. In some embodiments, the command is determined to be either an autotransfer command or a non-autotransfer command. If the command is a non-autotransfer command, then the sequencer does not proceed directly to the data transfer phase but rather requires microprocessor intervention before proceeding to the data transfer phase. In some embodiments, an autotransfer command (such as an autotransfer or an autowrite command) is carried out by the disk drive controller integrated circuit with only two interrupts being generated to the microprocessor: one after receiving the autotransfer command from the initiator; and one after data transfer of the autotransfer command is complete. The hard disk controller integrated circuit automatically sends the status byte and command complete message if there is no queue tag collision as indicated by a cleared tag not okay flag.

3 Claims, 41 Drawing figures

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L7: Entry 21 of 27

File: USPT

Mar 18, 1997

US-PAT-NO: 5613076

DOCUMENT-IDENTIFIER: US 5613076 A

TITLE: System and method for providing uniform access to a SCSI bus by altering the arbitration phase associated with the SCSI bus

DATE-ISSUED: March 18, 1997

INVENTOR-INFORMATION:

| NAME           | CITY       | STATE | ZIP CODE | COUNTRY |
|----------------|------------|-------|----------|---------|
| Latif; Farrukh | Malvern    | PA    |          |         |
| Nguyen; Hung   | Downington | PA    |          |         |

ASSIGNEE-INFORMATION:

| NAME               | CITY      | STATE | ZIP CODE | COUNTRY | TYPE CODE |
|--------------------|-----------|-------|----------|---------|-----------|
| Unisys Corporation | Blue Bell | PA    |          |         | 02        |

APPL-NO: 08/ 352051   [\[PALM\]](#)

DATE FILED: November 30, 1994

INT-CL: [06] [G06](#) [F](#) [13/36](#)

US-CL-ISSUED: 395/293; 395/856, 395/859

US-CL-CURRENT: [710/113](#); [710/36](#), [710/39](#)

FIELD-OF-SEARCH: 395/856, 395/859, 395/860, 395/865, 395/868, 395/731, 395/732, 395/734-737, 395/298-301, 395/893, 395/200.12, 395/200.13, 395/293, 395/294, 395/296

PRIOR-ART-DISCLOSED:

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|                          | PAT-NO                  | ISSUE-DATE     | PATENTEE-NAME  | US-CL     |
|--------------------------|-------------------------|----------------|----------------|-----------|
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| <input type="checkbox"/> | <u>5287463</u> | February 1994  | Frame et al.     | 395/325 |
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| <input type="checkbox"/> | <u>5475850</u> | December 1995  | Kahn             | 395/293 |

ART-UNIT: 235

PRIMARY-EXAMINER: Harvey; Jack B.

ASSISTANT-EXAMINER: Etienne; Ario

ATTY-AGENT-FIRM: Sterne, Kessler, Goldstein & Fox P.L.L.C.

ABSTRACT:

A host device SCSI bus controller in SCSI bus system for uniformly distributing I/O tasks, thereby providing all devices equal access to a SCSI bus without decreasing the overall utilization of the bus. The controller prevents system errors from occurring due to I/O tasks not being transmitted when the connectivity of the bus is fully utilized and the bus is operating near saturation. The controller alters the host device performance during the arbitration phase by replacing the single occurrence of the SCSI standard specified arbitration phase with multiple arbitration phases. In the multiple arbitration phases the controller does not assert the host device ID until a user determined time after the completion of the SCSI standard specified arbitration phase. When the host device has an I/O command to transmit, SCSI bus controller executes a first arbitration phase, wherein it does not assert the host device ID unless there are no reselecting target devices and not until a user defined time after the SCSI standard specified arbitration delay has completed. This gives a reselecting target device the opportunity to gain control over the SCSI bus. Then, if there are additional reselecting target devices on the SCSI bus, the SCSI bus controller performs additional arbitration phases until the bus is free. At that time, the SCSI bus controller issues the pending I/O command. By delaying the assertion of the host device ID during repeated arbitration phases, the SCSI bus controller enables the remaining target devices the opportunity to sequentially gain control over the SCSI bus. The SCSI bus controller therefore allows all target devices to reselect the host device to complete previously issued I/O tasks prior to the host device issuing additional I/O commands. The SCSI bus controller allows for an exception when a host I/O command is delayed to such an extent that further delay will cause a system error. Under such conditions, the SCSI bus controller asserts the host ID during the next standard arbitration phase. The host will then win arbitration and transmit the critical I/O command.

11 Claims, 14 Drawing figures

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US005732223A

## United States Patent (19)

Moore et al.

(11) Patent Number: 5,732,223

(45) Date of Patent: Mar. 24, 1998

(34) SCSI HOST ADAPTER WITH SHARED  
COMMAND AND DATA BUFFER(75) Inventors: Richard S. Moore, Irvine; David J.  
O'Ebea, Newport Beach, both of Calif.(73) Assignee: Future Domain Corporation, Inc.,  
Irvine, Calif.

(21) Appl. No.: 963,584

(22) Filed: Oct. 26, 1992

## Related U.S. Application Data

(63) Continuation-in-part of Ser. No. 667,754, Mar. 11, 1991,  
abandoned.(31) Int. Cl.<sup>6</sup> ..... G06F 13/40

(32) U.S. Cl. .... 395/250; 395/800

(58) Field of Search ..... 395/225, 373,  
395/800, 280, 292, 474, 250

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| 5,428,741 | 6/1995 | Ho et al.      | 395/162 |
| 5,450,609 | 9/1995 | Schmitt et al. | 395/600 |
| 5,454,083 | 9/1995 | Gajjar et al.  | 395/283 |
| 5,504,968 | 4/1996 | Kokkiden       | 395/273 |

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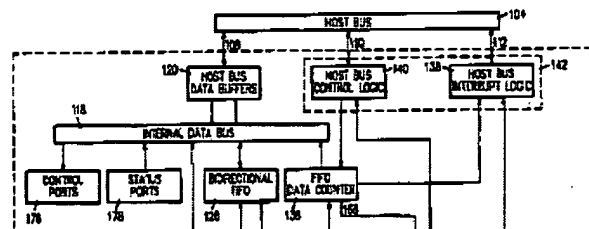
Primary Examiner—William M. Treat  
 Assistant Examiner—Zarni Maung  
 Attorney, Agent, or Firm—Sijervan, Morrell, MacPherson,  
 Franklin & Friel, LLP

(57)

## ABSTRACT

A small computer system interface (SCSI) controller circuit, connected between a host computer bus and a SCSI bus, includes a storage buffer shared between command and data signals provided by a host computer to a target SCSI peripheral device. The shared buffer includes a bidirectional FIFO which is used for intermediate storage of command blocks between transferred the host and the target device as well as data blocks. In the case of data transfers from the host to the target device, a command block is written to the bidirectional FIFO followed by as much of the data block as will fit in the remaining FIFO space. After the target device has read the command block, it accesses the SCSI bus and begins the transfer of data from the FIFO. In the case of data transfers from the target device to the host, a data transfer command block is first written to the FIFO by the host. The command block is read by the target device which then provides the requested data to the FIFO over the SCSI bus. The host system receives the requested data from the same shared storage buffer to which the command block was written.

15 Claims, 1 Drawing Sheet



(11) Patent Number: 4,488,287

[45] Date of Patent: Dec. 11, 1984

- Primary Examiner**—Douglas W. Olms  
**Assistant Examiner**—Wellington Chin  
**Attorney, Agent, or Firm**—John T. O'Halloran; Jeffrey P. Morris

[57] ABSTRACT

The present invention discloses a data partitioning technique wherein the PCM speech transmission data field is utilized to contain both digitized speech (for example, from a telephone) and other data (for example, from a data terminal) in the same channel within a frame having a plurality of channels e.g. 32 channels, of information. This enables the speech and data to be combined in a common information field and simultaneously transmitted in the same channel, frame by frame, through a digital switching network to other system users. Also, in accordance with the present invention, system users can individually selectively access a data base system through the switching network, such that the same information can be broadcast from the database system to a plurality of system users, or such that different information can be accessed in the database system by a plurality of system users and simultaneously transmitted to different users in different channels. A novel technique for transmitting information from the database system via a telecommunication systems tone bus interconnects the system is described.

38 Claims, 11 Drawing Figures

38 Claims, 11 Drawing Figures

38 Claims, 11 Drawing Figures

38 Claims, 11 Drawing Figures

38 Claims, 11 Drawing Figures

## 38 Claims, 11 Drawing Figures

## 38 Claims, 11 Drawing Figures

38 Claims, 11 Drawing Figures

